

Memorandum

To : Marley Hart, Executive Officer
Occupational Safety and Health Standards Board
2520 Venture Oaks Way, Suite 350
Sacramento, CA 95833

Date: August 30, 2013

RECEIVED

From : Ellen Widess, Chief *EW*
Division of Occupational Safety and Health

SEP 05 2013

**OCCUPATIONAL SAFETY AND HEALTH
STANDARDS BOARD**

Subject: Division Evaluation of Petition 536 from Wesley Selvidge of Buttonwillow Land and Cattle Company and Darren Filkins of WM. Bolthouse Farms, Inc.

On July 8, 2013, the Occupational Safety and Health Standards Board (Board) received a petition entitled "*Tractor Mounted Transportation Unit, Cal/OSHA Regulatory Standards and Enforcement, GISO 3441*," signed by Wesley Selvidge on behalf of the Buttonwillow Land and Cattle Company. This petition was assigned petition number 536 and was forwarded to the California Division of Occupational Safety and Health (Division) for evaluation, by letter dated July 9, 2013 and received July 11, 2013.

On July 11, 2013 the Board received a second petition from Darren Filkins of WM Bolthouse Farms, Inc. which the Board staff identified as being nearly identical to the first petition from Buttonwillow Land and Cattle Company. Bolthouse Farms was added as a joint petitioner to Petition 536 and forwarded to the Division on July 16, 2013 and received on July 24, 2013.

California Labor Code Section 142.2 permits interested persons to propose new or revised standards concerning occupational safety and health, and requires the Board to consider such proposals, and render a decision no later than six months following receipt. Further, as required by Labor Code Section 147, any proposed occupational safety or health standard received by the Board from a source other than the Division must be referred to the Division for evaluation, and the Division has 60 days after receipt to submit a report on the proposal.

The Division has therefore prepared this memorandum as an evaluation of this petition.

Actions requested by Petitioners

Petition 536 requested that the Board amend California Code of Regulations Title 8 Section 3441, Operation of Agricultural Equipment, and create regulations or guidelines to allow employees to ride on agricultural equipment. Specifically, the petition requests that personnel carriers attached to agricultural tractors be permitted to transport employees in order to reduce the risk of heat illness, tripping and falling, lower-body strains and sprains, reduce traffic on farm roads, and reduce airborne dust generated by vehicle traffic.

Existing Title 8 Regulations

Section 3441 became operative on May 13, 1977 and has been amended several times since. Currently Section 3441(a)(2)(B) prohibits riders on agricultural equipment except those persons needed for instruction of equipment operation.

§3441. Operation of Agricultural Equipment

(a) Operating Instructions and Safe Work Practices.

(2) Agricultural equipment shall be operated in accordance with the following safe work practices and operating rules:

(B) Permit no riders on agricultural equipment other than persons required for instruction or assistance in machine operation;

The use of personnel carriers mounted to an agricultural tractor for the transportation of employees is a violation of Section 3441(a)(2)(B) as it is currently written. The use of the personnel carriers is prohibited pursuant to this section regardless of whether employees are being transported through fields, on private roads, or on public roads.

Section 3440 requires rollover protective structures (ROPS) on tractors.

(a) All tractors shall be equipped with fenders or equivalent protection between the tractor operator and the tracks or rear wheels. On wheel tractors a minimum distance of 64 inches from the centerline of one driving wheel to the centerline of the opposite wheel will be considered equivalent protection. See Article 25 for ROPS and overhead protection.

Article 25, Section 3651 contains requirements for ROPS:

“(a) All agricultural and industrial tractors manufactured after October 25, 1976 (except industrial tow tractors), shall be equipped with rollover protective structures (ROPS) when operated by an employee.”

This section does not specifically limit the requirements for ROPS to the operator. Section 3651 does contain other requirements specifically directed at protecting the tractor operator.

Federal Regulations and Other Standards

Federal OSHA addresses the hazard of employees riding on agricultural equipment in Title 29 Code of Federal Regulations Occupational. Safety and Health Standards for Agriculture (established March. 9, 1976):

1928.57(a)(5) "Farm field equipment" means tractors or implements, including self-propelled implements, or any combination thereof used in agricultural operations.

1928.57(a)(6)(ii) Permit no riders on farm field equipment other than persons required for instruction or assistance in machine operation

Furthermore in Section 1928.51, Roll-Over Protective Structures (ROPS) For Tractors Used in Agricultural Operations, requires that employees on tractors be protected by ROPS and seatbelts:

1928.51(b)(1) Roll-over protective structures (ROPS). ROPS shall be provided by the employer for each tractor operated by an employee. Except as provided in paragraph (b)(5) of this section, a ROPS used on wheel-type tractors shall meet the test and performance requirements of 29 CFR 1928.52, 1928.53, or 1926.1002 as appropriate. A ROPS used on track-type tractors shall meet the test and performance requirements of 29 CFR 1926.1001.

1928.51 (b)(2)(i)(B) Ensure that each employee tightens the seatbelt sufficiently to confine the employee to the protected area provided by the ROPS.

No personnel carriers observed to date by the Division have been equipped with ROPS.

The Division has reviewed operation manuals from several agricultural tractor manufacturers for multiple models. The Division has found no manufacturers that do not prohibit riders on the equipment and has found no provisions from tractor manufacturers for building or attaching personnel carrier units.

Background

On January 24, 2011, former Division Chief Len Welsh responded to an inquiry from Grimmway Farms regarding personnel platforms attached to agricultural tractors used in conjunction with irrigation operations. He stated that Section 3441(a)(2)(B) did not prohibit the use of these specific platforms because they were specifically designed to transport employees. He also stated that in terms of a policy for general dissemination, safety considerations, including the types of operations, condition and characteristics of the landscape on which operations were conducted, and equipment design and structural integrity would require a complete review by Cal/OSHA.

On September 20, 2011, Division Chief Ellen Widess informed Grimmway that the previous letter was in error, and that Cal/OSHA would convene a stakeholder meeting to address these issues, after consultation with agricultural safety experts. She stated that the letter from Mr. Welsh was not the proper process to address Grimmway's request, and that under the Labor Code, Grimmway would need to apply for, and obtain a permanent variance from the Occupational Safety and Health Standards Board to place employees as riders on these platforms. She also offered to consider a request for a temporary variance.

The Division issued a temporary experimental variance¹ (TEV) to Grimmway Farms on May 4, 2012 to enable Grimmway Farms to demonstrate and validate the safety and effectiveness of the Grimmway Farms personnel carriers. The Division's TEV included specific conditions that covered the engineering design, construction, operating conditions, operating rules, inspection, and employee training. In addition, seatbelts and safety chains at openings are required to reduce the risk that occupants would fall, or be ejected from the personnel carriers. The Grimmway personnel carriers do not provide roll over protection, and the engineering analysis provided with the variance application did not address rollover or collision protection. Several administrative controls were included in the TEV to reduce the risk of rollover and collision. In 2011, the Division also began a process of consultation with agricultural safety experts from NIOSH, OSHA, and California universities. A stakeholder meeting was held in Modesto on March 26, 2012, which was attended by employers, industry representatives, community-based organizations, Standards Board staff,

¹ Labor Code Section 6452 permits the Division "to grant a temporary variance from any standard or portion thereof whenever it determines such variance is necessary to permit an employer to participate in an experiment approved by the director designed to demonstrate or validate new and improved techniques to safeguard the health or safety of workers." These temporary variances are referred to as "temporary experimental variances," to distinguish them from other temporary variances granted by the Division.

and NIOSH and academic agricultural safety experts. The purpose of the meeting was to gather information about the in-field use of tractor-mounted or trailed personnel carriers, and about factors that affect the safe use of this equipment

The Division has been conducting regular site visits to different Grimmway locations to determine whether the conditions of the TEV provide sufficient protection to employees who use the personnel carriers. Grimmway Farms has applied for a permanent variance from the Occupational Safety and Health Standards Board which, if granted, will replace the temporary variance. The Division has recommended that many of the conditions from the TEV be incorporated into any permanent variance.

One other employer has recently applied to the Division for a TEV to use personnel carriers. The Division has not been notified of any applications for a permanent variance other than Grimmway Farms.

Enforcement Experience of the Division of Occupational Safety and Health

Over the past 10 years, the Division has conducted 56 inspections as a result of which citations were issued for violations of 3441(a)(2)(B). Twenty-three of the 56 inspections (41 percent) were accident investigations² where employees riding on agricultural equipment were killed (2 cases), seriously injured³ (20 cases), or sustained an injury not classified as serious (1 case). Twelve serious citations and 11 non-serious citations of Title 8 section 3142(a)(2)(B) were issued for the 23 accident investigations.

Nearly all the accidents occurred when employees fell from agricultural equipment and suffered injury from the impact of the fall or were run over by equipment after the fall. One of the serious injuries occurred while an employee was riding on a personnel carrier mounted to the side of an agricultural tractor when the employee fell out of the personnel carrier and was then run over by the moving equipment (Inspection 316720317 – Hall Management Corp.). In another case, an agricultural tractor carrying an employee on the fender rolled over, causing serious injuries to the passenger (Inspection 310551007 – A Bar Ag Enterprises). A personnel carrier would not have prevented this injury, unless the carrier had been equipped with ROPS and a seat belt.

In addition to the above cases, an employee who was riding on a personnel carrier sustained serious injuries. This case did not result in a 3441(a)(2)(B) citation from the Division and is not included in the 23 accidents listed above.⁴ The employee was riding on a personnel carrier welded to a pesticide spray rig. The spray rig was pulled by and attached to a tractor by a single unsecured hitch pin. The pin came out due to uneven ground, resulting in the spray rig and personnel carrier with the employee on it becoming detached. The employee fell down an embankment and suffered multiple bone fractures, was hospitalized for several weeks and is permanently disabled (Inspection 311069132 – California State Prison, Solano). The Division cited Section 3328 which covers the design and use of machinery and equipment rather than Section 3441 in this case.

² The accidents summarized represent only those serious accidents and fatalities reported to the Division, as required by California Labor Code Sections 6409.1 and 6409.2 and Title 8, California Code of Regulations Section 342. A number of studies, including a 2009 report by the Government Accountability Office (Enhancing OSHA's Records Audit Process Could Improve the Accuracy of Worker Injury and Illness Data GAO-10-10, Oct 15, 2009) have found significant underreporting of workplace injuries to OSHA.

³ California Labor Code Section 6302, "Serious injury or illness" means any injury or illness occurring in a place of employment or in connection with any employment which requires inpatient hospitalization for a period in excess of 24 hours for other than medical observation or in which an employee suffers a loss of any member of the body or suffers any serious degree of permanent disfigurement, but does not include any injury or illness or death caused by the commission of a Penal Code violation, except the violation of Section 385 of the Penal Code, or an accident on a public street or highway.

⁴ The federal IMIS system, which is used to record all enforcement actions, has limited search capabilities. This case was not identified during the database search, but was identified because an individual Cal/OSHA inspector mentioned the case. There may have been other accidents involving personnel carriers which did not result in citations for violations of 3441(a)(2)(B) and which were not identified by the IMIS search.

Hazards to Riders on Agricultural Equipment

The prohibition against riders on tractors and other agricultural equipment is based on a history of injuries, including fatalities, to employees due to:

1. Equipment upset, including rollovers.
2. Collisions.
3. Falls from equipment.
4. Injuries resulting from trailers or other towed equipment that become detached from the tractor, or that destabilized the tractor.

1. Rollover. When a tractor or other agricultural equipment overturns (rollover or tip-over), employees who are not restrained (by a functional seatbelt, for example) are likely to fall from the equipment and be crushed. Employees who are restrained to the equipment are also at risk of being crushed unless they are protected by ROPS. Both federal OSHA and Cal/OSHA regulations require that employees in agricultural tractors be protected by ROPS; however, tractors typically only have ROPS at the operator position.

Personnel carriers attached to agricultural equipment in California currently are not safeguarded by rollover protective structures. The carriers are not designed nor built to sustain the forces imposed on them during a rollover. They are likely to collapse during a rollover with the occupants being crushed if such an event were to occur.

The risk of rollover incidents increases whenever the motion of a tractor differs from travelling in a straight line, at a slow speed on even ground. Any activity that reduces the stability of the tractor or tractor-trailer combination may increase the risk of vehicle rollover, including:

1. Traversing slopes.
2. Moving at the edge of ditches, roads, or other areas where the level or traction of one or more wheels differs significantly or changes suddenly,
3. Making sharp turns.
4. Making turns with a trailer, due to the combined effects of directional forces induced by the tractor-trailer combination.
5. Collisions with other vehicles.

Rollovers are not a remote or unlikely risk in agriculture as tractor overturns were the leading cause of death for agriculture in the U.S. for 2010 according to the National Institute for Occupational Safety and Health (NIOSH) with most roll-over deaths occurring in tractors not equipped with ROPS. Tractor overturns accounted for 1,411 (50%) of tractor-related worker deaths from 1992 to 2005⁵. NIOSH estimates that fatality rates due to tractor overturns could be reduced by a minimum of 71% if all tractors were equipped with ROPS in the U.S.⁶

2. Collisions. The presence of other vehicles creates a potential for vehicle collisions. Personnel carriers are not designed nor built to protect the passengers in the event of a collision from any direction. Occupants are likely to suffer serious injury or death in the event of a collision depending on the speed of the vehicles.

⁵ Agriculture, Forestry, and Fishing Program National Academies Review, December 2006. National Institute for Occupational Safety and Health.

⁶ NIOSH. 1993. Public health focus: Effectiveness of rollover protective structures for preventing injuries associated with agricultural tractors. MMWR 42(3):57-59

When employees are transported on a personnel carrier on farm and public roads, they must share the road with other vehicles at varying velocities increasing the risk of a collision. Agricultural vehicles will need to pull over to the edge of the road on uneven ground so that other vehicles may pass. The risk of rollover from uneven traction and level as described above are increased at the edge of the road.

3. Falls from Equipment and Run-overs. Employees who ride on tractor-mounted personnel carriers with an opening, or who otherwise ride on tractors or equipment may fall or be thrown from the equipment. In addition to injuries resulting from the fall, employees who fall are then in danger of being struck or run over by either the equipment from which they fell, or other equipment in the area. Some personnel carriers are equipped with seatbelts to prevent falls and run-overs. To be effective, seat belts must meet established standards. Without ROPS, seatbelts may prevent falls, but may hold the employee in place during a rollover, and subject the employee to crushing injuries.

Agricultural equipment run-overs are another common cause of fatalities. After rollovers, run-overs are the second most common type of death associated with farm tractors in the US, accounting for 759 deaths between 1992 and 2005⁷. An additional 240 run-over deaths occurred during this time period involving other types of agricultural machines. About half of these run-overs (485 deaths) involved the operator falling from and being run over by the moving equipment.

The personnel carriers may also become detached from tractors due to hitch pin failure, hitch pins falling out, weld failure, or other structural failure of the personnel carrier. Employees can fall to the ground while in the personnel carriers in the event of a detachment. Employees can be injured from:

1. The direct impact of striking the ground.
2. Being thrown from the personnel carrier and impacting the ground or being run over by any towed equipment.
3. Being struck while in the personnel carrier by towed equipment.
4. Being rolled over while within the personnel carrier due to the instability caused by the personnel carrier falling to the ground and stopping while the momentum of towed equipment continues forward.
5. From projections resulting from structural failure of the personnel carriers upon striking the ground.
6. A partial failure, where one or two pins fail and the personnel unit is still attached to the tractor, which can destabilize the tractor and lead to a roll-over.

4. Trailers and Towed Equipment. Irrigation pipe trailers, and other trailers or towed equipment are commonly hitched directly to the rear of personnel carriers. The trailers are typically simple four-wheeled trailers without the independent emergency braking systems that are required for certain over-the-road trailers. The hitch used for the trailer does not provide equivalent stability to the three point hitch otherwise used for towing agricultural implements, and may be more likely to fail with changes in elevation, lateral or torsional forces, or anything that induces a bucking motion in the tractor or trailer.

If a hitch fails, the trailer may create an unbalanced load which upsets the tractor causing a rollover accident. If a trailer becomes fully detached due to a hitch failure, the trailer may become free-wheeling and collide with a carrier on the back of the tractor on which the employees are riding. This presents at least two potential hazards: the trailer hitch or other parts of the trailer could crush the personnel carrier at the point of

⁷ Agriculture, Forestry, and Fishing Program National Academies Review. December 2006. National Institute for Occupational Safety and Health

contact, or irrigation pipes or other material on the trailer could be projected forward from the trailer bed toward personnel carrier and seriously injure the occupants. A free-wheeling trailer is more likely to occur and be a more serious risk on a farm or public road rather than in a furrowed field where the soft ground and lower speeds reduce risks.

Minimum Requirements for Personnel Carriers

The Division has found that there is a broad range of personnel carriers in use. For example, some units are mounted to the tractor's three-point hitch designed for attachment of agricultural implements. Some units have been welded to the sides of tractors, and some are trailed and attached to the rear pin hitch. Some units are open in construction, and expose employees to contact with moving parts, while others are mostly enclosed with expanded metal. Some units provide no impediment to accidental falls from the unit. Some rear mounted units are entered at a point beyond the rear axle of the tractor, while others require employees to pass through the tractor wheel path. Some units contain a rear hitch to attach a tractor. Some units have been approved by engineers and constructed by certified welders. Some units have been found with defective attachments and/or structures. In addition, employees may ride on platforms that are part of processing units, and designed for employees to stand while the platform is stationary. The Division has not seen any units that have ROPS or which have been evaluated for collision protection⁸.

Based on the Division's experience in the Enforcement and Consultation units, consultations with agricultural experts, and the experience gained through the one temporary variance issued regarding Section 3441(a)(2)(B), the Division believes that the following issues must be addressed by any possible regulation permitting personnel carriers mounted on, or trailed by, agricultural equipment.

Engineering Design and Construction. In designing equipment, engineers typically rely on consensus standards to establish important parameters. At this time, the Division is not aware of any U.S. or international standard⁹ that addresses personnel carriers. The Division is also not aware of a tractor or agricultural equipment manufacturer who provides personnel carriers for attachment to tractors. The personnel carriers in use today have been fabricated by employers in their own shops or constructed by independent fabrication shops to specifications provided by the employer or to unknown specifications.

As with California's pioneering work with impalement protection, if the Board adopts a regulation permitting the use of tractor-mounted personnel carriers, it will be necessary to include criteria for acceptable equipment. The following mechanical aspects should be addressed:

- Structural integrity of the carrier and mounting or attachment mechanism
- Collision protection
- Rollover protection
- Stability of the tractor/carrier or tractor/carrier/trailer combination, including:
 - Tractor capacity
 - Appropriate location of carrier, including locating personnel away from hazards such as fuel tanks and rotating shafts or other moving equipment
 - Ballasting
 - Trailed loads

⁸ TMM Equipment Inc, a mining equipment company in Canada advertises that it can construct a tractor-mounted personnel carrier with ROPS for use in Canadian mine, but the company has not responded to the Division's attempts to contact them.

⁹ Such standards are typically adopted by organizations such as the American National Standards Institute or the American Society of Agricultural and Biological Engineers

- Vehicle handling criteria
- Protection for riders against:
 - Falling from the carrier
 - Impact or impalement from objects that may be released from trailers
 - Mounting carriers within the wheelbase of the tractor, or tractor/trailer, exposing employees to run-over

Administrative Controls

In addition to the mechanical and design characteristics addressed above, a regulation should address the following administrative controls:

- **Usage.** Personnel carrier use on public and farm roads puts employees increases the types of risks or injuries compared to use in furrowed fields. Tractors equipped with personnel carriers can be operated at much higher speeds on roads than in furrowed fields, increasing the risk for roll-overs, collisions, and equipment failure. There is also greater exposure to traffic on roads including cross traffic at intersections and faster vehicles passing the tractors. These traffic hazards increase the likelihood of a collision. Additionally, there is an increased exposure to uneven ground hazards on roads such as dirt shoulders on paved roads, potholes, slopes near ditches, etc. All of the listed conditions increase the potential for rollovers. In considering any regulation permitting the use of tractor-mounted personnel carriers, the Board should consider whether the risks associated with on-road use of the equipment should limit permissible use to the furrowed field, or whether additional operating restrictions should be required for use on private roads. (The Division understands that the use of tractor-mounted personnel carriers on public roads would be affected by other laws and regulations regarding motor vehicle operation in California.)
- **Operating Rules and Conditions.** To reduce the likelihood of accidents, a regulation allowing the use of personnel carriers would need to address:
 - Safe speed limits,
 - Use of seatbelts and closures for openings in platforms
 - Prohibiting riders in conditions which increase the risk of destabilizing the tractor or tractor/trailer combination, such as operating near ditches, on uneven terrain, or steep slopes.
 - Safe stowage of any equipment that must be carried in the platform, so that it does not become a projectile in the case of sudden stops or starts.
- **Inspection and Maintenance.** Personnel carriers will be exposed to the outdoor elements and are subject to corrosion. The daily impact and vibrational forces on the personnel carriers will also degrade the personnel carriers and their components, such as connection pins, over time. To ensure that defective personnel carriers do not endanger employees, regulations should require a detailed inspection and maintenance program. Frequent inspections are also needed to verify that employees and supervisors are knowledgeable of and following all safe operating rules.
- **Training.** The safety of personnel carriers are dependent on their proper care, use and operation. A regulation permitting the use of tractor-mounted personnel carriers should provide for effective initial and refresher training for the employees and supervisors who inspect, maintain, and use the units. Employees who use the personnel carriers should be capable of recognizing unsafe conditions, including defects in the equipment, in addition to being trained on the safe operating rules.

Alternatives to Amending Section 3441.

Employees may be safer if transported in a passenger vehicle rather than riding in a personnel carrier attached to a tractor. The Society for Automotive Engineers (SAE) and other groups have already established design standards that address issues such as vehicle stability, rollover protection and collision protection. A new regulation may not be necessary where a simple and practical alternative to their use already exists, particularly for use on private and public roads. The prohibition against riders on agricultural equipment is found in national as well as state regulations, and has been protecting farm workers for 40 years. In assessing the need for this new regulation, the Division believes that the different potential uses – in-field, private roads, and public roads should be considered and separately evaluated.

The Division has worked with one employer to develop a variance which would enable them to safely use personnel carriers in certain limited circumstances, including use in the furrowed field and on private roads. A second employer is now pursuing that option. The use of variances to develop more information under controlled circumstances may be an appropriate immediate response to the issues that have led to the petitions.

Division Recommendation

The Division believes that there may be reasons for the Board to consider the benefits and disadvantages of amending Section 3441 to allow for the use of personnel carriers mounted onto agricultural tractors. However, creating such a regulation would require the Board to establish minimum requirements for the design, construction, use, and maintenance of personnel carriers. This is particularly difficult in the absence of federal or consensus standards.

The Division believes that these issues are best addressed through an advisory process. The advisory process would also aid in addressing any issues of federal equivalence. Several stakeholders have already requested to be included in such a process. Therefore, the Division recommends that the Board refer the petition to an advisory committee or alternatively, request the Division to conduct an advisory committee on this issue.

cc: Christine Baker
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